

Response  
Application No. 10/735,899  
Attorney Docket No. 032172

### **AMENDMENTS TO THE CLAIMS**

This listing of claims replaces all prior versions of claims in the application.

### **LISTING OF THE CLAIMS:**

Claim 1 (Currently Amended): A redundancy management method for BIOS, comprising the steps of:

using one of a pair of memories, which respectively store the BIOS for setting hardware in an environment in which OS can use said hardware, for operation and the other for standby;

switching to the BIOS in said memory in standby when the BIOS in said one memory cannot be booted; and

executing an update of said BIOS by writing to said memory in standby;

permitting switching said memory in standby to in operation when the update of said BIOS in said memory in standby succeeded; and

writing the BIOS of said memory switched to operation, to said memory switched to standby for redundancy after said switching.

Claim 2 (Canceled).

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Claim 3 (Currently Amended): The redundancy management method according to Claim 1, further comprising a step of switching said permitted memory in standby to in operation, and said memory in operation to in standby when said hardware is started up.

Claim 4 (Canceled).

Claim 5 (Original): The redundancy management method for BIOS according to Claim 1, further comprising a step of preventing switching of said memory in standby to said memory in operation when the update of said BIOS in said memory in standby failed.

Claim 6 (Currently Amended): The redundancy management method for BIOS according to Claim 1 [[4]], further comprising a step of preventing switching said memory switched to standby, to said memory in operation when writing of said BIOS in said memory switched to standby failed.

Claim 7 (Currently Amended): A The redundancy management method for BIOS according to Claim 3, further comprising a step of, comprising the steps of:

using one of a pair of memories, which respectively store the BIOS for setting hardware in an environment in which OS can use said hardware, for operation and the other for standby;

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switching to the BIOS in said memory in standby when the BIOS in said one memory cannot be booted;

executing an update of said BIOS by writing to said memory in standby;

permitting switching said memory in standby to in operation when the update of said BIOS in said memory in standby succeeded;

switching said permitted memory in standby to in operation, and said memory in operation to in standby when said hardware is started up; and

preventing execution of said switching when said hardware is started up for power recovery.

Claim 8 (Currently Amended): The redundancy management method for BIOS according to Claim 1 [[4]], further comprising a step of preventing execution of said redundancy step when said hardware is started up for power recovery.

Claim 9 (Original): The redundancy management method for BIOS according to Claim 1, further comprising a step of executing the update of BIOS in a memory in standby of another hardware connected with said hardware according to the update of the BIOS in said memory in standby of said hardware.

Claim 10 (Original): The redundancy management method for BIOS according to Claim 1, further comprising a step of executing the synchronization processing of the BIOS with another hardware connected with said hardware.

Claim 11 (Currently Amended): A data processing apparatus, comprising:

a hardware including a CPU;

a pair of memories which respectively store a BIOS for setting said hardware in an environment in which OS can use said hardware; and

a service processor for using one of said pair of memories for operation and the other for standby when said hardware is started up and switching to the BIOS in said memory in standby when the BIOS of said one memory cannot be booted,

wherein said CPU executes the update of said BIOS by writing to said memory in standby,

wherein said service processor permits switching said memory in standby to said memory in operation when the update of said BIOS in said memory in standby succeeded, and

wherein said CPU writes the BIOS of said memory switched to operation, to said memory switched to standby for redundancy after said switching.

Claim 12 (Canceled).

Claim 13 (Currently Amended): The data processing apparatus according to Claim 11 ~~12~~, wherein said service processor switches said permitted memory in standby to a memory in operation, and said memory in operation to said memory in standby when said hardware is started up.

Claim 14 (Canceled).

Claim 15 (Original): The data processing apparatus according to Claim 11, wherein said CPU prevents switching said memory in standby to the memory in operation when the update of said BIOS in said memory in standby failed.

Claim 16 (Currently Amended): The data processing apparatus according to Claim 11 ~~14~~, wherein said CPU prevents switching said memory switched to standby, to said memory in operation when writing of said BIOS in said memory switched to standby failed.

Claim 17 (Original): The data processing apparatus according to Claim 11, further comprising another hardware connected with said hardware, and

said hardware executes the update of the BIOS in the memory in standby of said other hardware connected with said hardware according to the update of the BIOS in said memory in standby of said hardware.

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Claim 18 (Original): The data processing apparatus according to Claim 11, wherein said hardware executes the synchronization processing of the BIOS with said other hardware connected with said hardware.

Claim 19 (Currently Amended): A storage system, comprising:

a storage control apparatus comprises:

a hardware including a CPU;

a pair of memories which respectively store a BIOS for setting said hardware in an environment in which OS can use said hardware; and

a service processor for using one of said pair of memories for operation and the other for standby when said hardware is started up and switching to the BIOS in said memory in standby when the BIOS of said one memory cannot be booted; and

a plurality of storage devices connected to said storage control device,

wherein said CPU of said storage control apparatus executes the update of said BIOS by writing to said memory in standby,

wherein said service processor of said storage control apparatus permits the switching of said memory in standby to said memory in operation when the update of said BIOS in said memory in standby succeeded, and

wherein said CPU of said storage control apparatus writes the BIOS of said memory switched to operation, to said memory switched to standby for redundancy after said switching.

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Claim 20 (Canceled).

Claim 21 (Currently Amended): The storage system according to Claim 19 ~~20~~, wherein said service processor of said storage control apparatus switches said permitted memory in standby to a memory in operation, and said memory in operation to said memory in standby when said hardware is started up.

Claim 22 (Canceled).

Claim 23 (Original): The storage system according to Claim 19, wherein said CPU of said storage control apparatus prevents switching said memory in standby to the memory in operation when the update of said BIOS in said memory in standby failed.

Claim 24 (Currently Amended): The storage system according to Claim 19 ~~22~~, wherein said CPU of said storage control apparatus prevents switching said memory switched to standby, to said memory in operation, when writing of said BIOS in said memory switched to standby failed.

Claim 25 (Original): The storage system according to Claim 19, further comprising another storage control apparatus, which is connected to said storage devices and said storage control apparatus and for controlling said storage devices,

wherein said storage control apparatus executes the update of the BIOS in the memory in standby of said other storage control apparatus according to the update of the BIOS in said memory in standby of said storage control apparatus.

Claim 26 (Original): The storage system according to Claim 19, further comprising another storage control apparatus, which is connected to said storage devices and said storage control apparatus and for controlling said storage devices,

wherein said storage control apparatus executes the synchronization processing of the BIOS with said other storage control apparatus.

Claim 27 (New): A data processing apparatus, comprising:

a hardware including a CPU;

a pair of memories which respectively store a BIOS for setting said hardware in an environment in which OS can use said hardware; and

a service processor for using one of said pair of memories for operation and the other for standby when said hardware is started up and switching to the BIOS in said memory in standby when the BIOS of said one memory cannot be booted,



wherein said CPU executes the update of said BIOS by writing to said memory in standby,

wherein said service processor permits switching said memory in standby to said memory in operation when the update of said BIOS in said memory in standby succeeded,

wherein said service processor switches said permitted memory in standby to a memory in operation, and said memory in operation to said memory in standby when said hardware is started up, and

wherein said CPU prevents execution of said switching when said hardware is started up for power recovery.

Claim 28 (New): A storage system, comprising:

a storage control apparatus comprises:

a hardware including a CPU;

a pair of memories which respectively store a BIOS for setting said hardware in an environment in which OS can use said hardware; and

a service processor for using one of said pair of memories for operation and the other for standby when said hardware is started up and switching to the BIOS in said memory in standby when the BIOS of said one memory cannot be booted; and

a plurality of storage devices connected to said storage control device.

wherein said CPU of said storage control apparatus executes the update of said BIOS by writing to said memory in standby,

wherein said service processor of said storage control apparatus permits the switching of said memory in standby to said memory in operation when the update of said BIOS in said memory in standby succeeded,

wherein said service processor of said storage control apparatus switches said permitted memory in standby to a memory in operation, and said memory in operation to said memory in standby when said hardware is started up, and

wherein said CPU prevents execution of said switching when said hardware is started up for power recovery.

Claim 29 (New): A redundant management method for BIOS, comprising the steps of:  
booting updated BIOS in a first memory; and  
copying the updated BIOS in the first memory to a second memory that stored BIOS before said updating after said booting.

Claim 30 (New): A data processing apparatus, comprising:  
a hardware including a CPU;  
a pair of memories which respectively store a BIOS for setting said hardware in an environment in which OS can use said hardware; and

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wherein said CPU boots an updated BIOS in one of said pair of memories and copies said updated BIOS in the said one of said pair of memories to the other memory before said updating after said booting.

Claim 31 (New): A storage system, comprising:

a storage control apparatus comprises:

a hardware including a CPU;

a pair of memories which respectively store a BIOS for setting said hardware in an environment in which OS can use said hardware; and

a plurality of storage devices connected to said storage control device,

wherein said CPU boots an updated BIOS in one of said pair of memories and copies said updated BIOS in the said one of said pair of memories to the other memory before said updating after said booting.